

### **Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (currently amended) A Phase Locked Loop comprising a frequency detector including a balanced quadricorrelator, ~~the loop being characterized in that the~~ balanced quadricorrelator comprises double edge clocked bi-stable circuits coupled to multiplexers being controlled by a signal having the same bitrate as the incoming signal comprising:  
a first pair of double edge clocked bi-stable circuits coupled to a first multiplexer, the first pair of double edge clocked bi-stable circuits to provide a first signal;  
a second pair of double edge clocked bi-stable circuits coupled to a second multiplexer, the second pair of double edge clocked bi-stable circuits supplied by the mutually quadrature phase shifted signals to provide a second signal, wherein the first and the second multiplexors are controlled by a control signal having the same bitrate as the incoming signal;  
a third pair of double edge clock bi-stable circuits coupled to a third multiplexer supplied by the first signal; and  
a fourth pair of double edge clock bi-stable circuits coupled to a fourth multiplexer supplied by the second signal.
2. (currently amended) A Phase Locked Loop as claimed in claim 1, wherein ~~a first pair of double edge clocked bi-stable coupled to a first multiplexer and a second pair of double edge clocked bi-stable coupled to a second multiplexer~~ the first and second pair of double edge clocked bi-stable circuits are supplied by mutually quadrature phase shifted signals respectively to provide a first the first signal and a second the second signal, wherein the first and second signals are indicative for a phase difference between the incoming signal and mutually quadrature phase shifted signals.

3. (original) A Phase Locked Loop as claimed in claim 2, wherein the mutually quadrature phase shifted signals are generated by a voltage controlled oscillator.
4. (canceled)
5. (currently amended) A Phase Locked Loop as claimed in ~~claim 4~~ claim 1, wherein the quadraticorrelator further comprises a first adder for adding a third signal provided by the third multiplexer to a fourth signal provided by a fourth multiplexer and generating an error signal indicative for a frequency difference between the incoming signal and mutually quadrature signals.
6. (original) A Phase Locked Loop as claimed in 5, wherein the error signal is inputted to a coarse control input of the voltage controlled oscillator via a first charge pump coupled to a first low-pass filter coupled to a second adder.
7. (original) A Phase Locked Loop as claimed in claim 6, wherein a fine control input is controlled by a signal provided by a phase detector coupled to a second charge pump coupled to second low-pass filter.